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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,735	05/19/2006	Ofer Mandelboim	2488.033	7654

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EXAMINER	
HAMUD, FOZIA M	

ART UNIT	PAPER NUMBER
1647	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/562,735	MANDELBOIM ET AL.	
	Examiner	Art Unit	
	FOZIA M. HAMUD	1647	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 February 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27 and 34-48* is/are pending in the application.

4a) Of the above claim(s) *12-19 and 34-46* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11, 20-27, 47-48* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12/29/05* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restriction

1a. Applicant's election without traverse of Group I, (1-11, 20-27, 47-48) in the reply filed on 26 January 2009 is acknowledged.

Applicant's reservation of the rights to pursue the non-elected claims in divisional applications is acknowledged.

The requirement is still deemed proper and is therefore made FINAL.

1b. Claims 1-27, 34-48 are pending, of which claims 1-11, 20-27 and 47-48 are drawn to the elected Group. Therefore, claims 12-19, 34-46 are withdrawn from prosecution as being drawn to a non-elected invention.

Priority:

2. The filing date of the instant Application, 12 March 2007, is used for the purposes of applying prior art.

Specification:

The disclosure is objected to because of the following informalities:

Brief Description of the Drawings:

3a. The Brief Description of the Drawings should be corrected. Figures 2, 3, 5, 8, 9 and 10 are shown in multiple panels (for example figure 2 comprises figures 2a-2d), however, the Brief Description of the Drawings only reflects one Figure 2, 3, 5, 8, 9 or 10. Appropriate correction of the Brief Description of the Drawings which reflects the appropriate multiple figures is required.

3b. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other

information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, the listed references have not been considered.

Claim Objections:

4. Claims 1 and 4 are objected to because of the following informalities:

4a. Claim 1 is missing a period at the end of the claim.

4b. Claim 4 is confusing. It is suggested to relocate the phrase "an active fragment, an isoform, an analog or a derivative thereof" (in lines 4-5), after the recitation of "SEQ ID NO: 3" in line 3.

Non-Statutory double Patenting:

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5a. Claims 1-3, 47, 24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 5, 12 of copending Application No. 10/580,428. Although the conflicting claims are not identical, they are not patentably distinct from each other because, the instant claims 1-3, 47 and 24 are drawn to an isolated peptide fragment of a natural cytotoxicity receptor of an NK cell, comprising a linker peptide connecting the extracellular domain of the receptor to the transmembrane portion of the receptor, said peptide exhibiting at least one activity selected from binding to a viral infected cell or binding to a tumor cell, said peptide which is glycosylalted, which is NKp46, a pharmaceutical composition comprising said peptide. Claims 1, 5 and 12 of '428 are drawn to an isolated peptide fragment of a natural cytotoxicity receptor (NCR) of natural killer (NK) cells, active fragments, analogs or derivatives thereof, the peptide fragment capable of binding to a membrane-associated biomolecule of a tumor cell, the biomolecule comprising at least one sulfated polysaccharide, said biomolecule serving as the binding site of the NCR mediating the lysis of tumor cells by NK ceils, with the proviso that said peptide is other than a full length NCR polypeptide or an isolated NCR extracellular domain, said peptide which is NKp46 and a pharmaceutical composition comprising said peptide. The invention recited in the claims of copending Application '428 is "genus" to the invention recited in the instant claims, because the isolated peptide fragment recited in the instant claims is one of the active fragments encompassed by the claims of '428. Therefore, since a claim to a species anticipates a claim to a genus, instant claims 1-5, 47 and 24 anticipate claims 1, 5 and 12 of '428.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

5b. Claims 20-23 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 3, 4, of copending Application No. 10/538,231. Although the conflicting claims are not identical, they are not patentably distinct from each other because, the instant claims 20-23 are drawn to a fusion protein comprising a linker peptide connecting the extracellular domain of the receptor to the transmembrane portion of the receptor, covalently conjugated to an immunoglobulin (Ig) or a cytotoxic substance and a pharmaceutical while claims 1, 3, 4 of '231 are drawn to an isolated polypeptide conjugate comprising: (a) a target recognition segment comprising a Natural Killer cell receptor (NCR) or an active fragment thereof, wherein the NCR is selected from the group consisting of NKp30 or a fragment thereof that binds to a cellular ligand expressed on the surface of a target tumor cell; and (b) a second segment comprising an active agent capable of exerting a cytotoxic effect on the target cell, wherein the active agent is selected from the group consisting of: an immunoglobulin (Ig) molecule and an Fc fragment of an immunoglobulin molecule; and wherein the target recognition segment (a) is covalently attached to the second segment (b); and wherein the conjugate is in the form of a dimer. The claimed invention is "genus" to the invention recited in the claims of copending Application "231, because the NKp30 fusion protein recited in the claims of copending Application "231 is encompassed by the instant claims. Therefore, since a claim to a species anticipates a claim to a genus, 1, 3, 4 anticipate instant claims 20-23.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 U.S.C. § 112:

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6a. Claims 1-11, 20-27, 47-48 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for an isolated NKp46D2 peptide fragment or a fusion protein comprising the natural cytotoxcity receptor NKp46 and the Fc portion of human IgG1, (NKp46-Ig), said molecules which bind to a viral infected cell or to a tumor cell, does not reasonably provide enablement for an isolated peptide fragment of a natural cytotoxicity receptor of an NK cell, comprising a linker peptide connecting the extracellular domain of the receptor to the transmembrane portion of the receptor, said peptide exhibiting at least one activity selected from binding to a viral infected cell or binding to a tumor cell, said peptide which is Glycosylated, which is NKp46 or a pharmaceutical composition comprising said peptide or a fusion protein comprising said peptide, other than the fusion protein of SEQ ID NOs:13-18. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, make and use the invention commensurate in scope with these claims.

The instant claims 1-11 encompass an isolated peptide fragment of a natural cytotoxicity receptor of an NK cell, comprising a linker peptide connecting the

extracellular domain of the receptor to the transmembrane portion of the receptor, said peptide exhibiting at least one activity selected from binding to a viral infected cell or binding to a tumor cell, said peptide which is glycosylalted, which is NKp46, and claim 4 further limits the claimed peptide as being an isolated peptide fragment comprising the amino acid sequence set forth in SEQ ID NO:3, an active fragment, an analog, an isoform, or a derivative thereof, with the proviso that said peptide is other than the polypeptide of SEQ ID NO:1 or 2. However, the instant specification teaches that NKp46-Ig and NKp46D2, (which refers to domain 2, the proximal domain of the NKp46 molecule corresponding to amino acids 121-254 of NKp46 of isoform A) both bind to hemagglutinin (HA) of influenza virus in viral-infected cells as well as tumor cells, (see Examples 3 and 6). The specification fails to teach any other isolated peptide fragment that retains the ability to bind to viral infected cells or tumor cells. The instant specification discloses that a single amino acid residue located within the proximal portion of the D2 domain of NKp46, is crucial for the recognition of both viral-infected cells and tumor cells by this natural cytotoxicity receptor, (see page 4, lines 1-9). Although the specification teaches that within the D2 domain there is a short linker peptide designated NKp46LP (residues 215-254 of the full length protein; SEQ ID NO:3) joining this domain to the transmembrane segment of the receptor, it teaches that a fragment comprising amino acids 121-254 or human NKp46 of isoform A binds viral infected cells or tumor cells, but it does not teach that a fragment consisting only the amino acid set forth in SEQ ID NO:3 retains the desired activity of binding to viral infected cells or tumor cells. Furthermore, the specification fails to teach an active

fragment, an analog, an isoform, or a derivative thereof, other than the NKp46-Ig fusion and NKp46D2.

With respect to claims 20-23, which encompass a fusion protein, the specification does not teach a fusion protein other than the fusion proteins comprising the amino acid sequences set froth in SEQ ID NO:13-18, that exhibit the desired activity of binding viral infected cells or tumor cells.

With respect to 24-27, which encompass "pharmaceutical composition", the specification must teach how to use the composition for at least one pharmaceutical use without undue experimentation for said claims to be enabled. Steadman's Medical Dictionary (24th Edition, 1982) defines pharmaceutical "drug" as "a therapeutic agent; any substance other than food, used in the prevention, diagnosis, alleviation, treatment or cure of disease in man and animal." However, administering a polypeptide to produce antibodies which are then collected from the animal and used in various ways is not a pharmaceutical use. In the present situation, to enable a pharmaceutical use for polypeptide of the claimed peptide fragment requires the specification to teach how to use the substance, without undue experimentation, for the prevention, diagnosis, alleviation, treatment or cure of a disease in the animal to which the substance is administered. However, the specification does not provide adequate guidance as to how said peptide fragment can be used to treat any disorders, and undue experimentation would be required of the skilled artisan to make and/or use the claimed invention in its full scope. Due to the lack of direction/guidance presented in the specification regarding pharmaceutical use of the claimed polypeptide, the complex

nature of the invention, the skilled artisan would not know how to use the invention recited in claims 24-27 in its full scope.

Applicants demonstrate that the amino acid Threonine at position 225 of NKp46 seems to play a dramatic role in the recognition of various targets by NK cells via different mechanisms and that when threonine 225 was substituted with alanine NKp46-Ig lost its ability to bind tumor ligands, but when substituted with asparagine binding was fully restored, (see Example 6, bottom of page 39). However, the specification does not disclose other single point mutations or substitutions, as encompassed by claim 47. With respect to claim 48, the specification does not demonstrate that replacement of Threonine 225 with a serine retains the desired activity of binding viral or tumor ligands. The prior art teaches that conservative amino acid substitutions do not necessarily always result in a predictable result. For example Wells, (see Wells, 1990, Biochemistry 29:8509-8517), documents the unpredictability of the relationship between sequence and function, albeit that certain specific sequences may be found to be conserved over proteins of related function upon a significant amount of further research. Also, Lazar et al (Mol. Cell. Biol., Vol. 8, pp. 1247-1252, 1988) showed that the conservative substitution of glutamic acid for aspartic acid at position 47 reduced biological function of transforming growth factor alpha while non-conservative substitutions with alanine or asparagine retained the protein function.

The criteria set forth in Ex parte Forman (230 USPQ 546 (Bd. Pat. App. & Int. 1986), and reiterated in In re Wands (858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988)), which include (1) the quantity of experimentation necessary, (2) the amount

of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art and (8) the breadth of the claims, is the basis for determining undue extermination. In the instant case, Applicant only discloses an isolated NKp46D2 peptide fragment or a fusion protein comprising the natural cytotoxcity receptor NKp46 and the Fc portion of human IgG1, (NKp46-Ig), said molecules which bind to a viral infected cell or to a tumor cell, and fails to disclose the characteristics of all the encompassed an active fragment, an analog, an isoform, or a derivative there that would ensure the retention of the desired activity. Furthermore, while recombinant techniques are available, it is not routine in the art to screen large numbers of peptide fragments that might potentially retain a desired activity, because the expectation of obtaining similar activity is unpredictable. Thus one of skill in the art would require additional guidance, such as information as to what structural features would result in an active fragment, an analog, an isoform, or a derivative of the claimed peptide fragment, which retain the desired activity. Thus, to make and use the invention commensurate with the scope of the claims would result in undue experimentation.

6b. Claims 1-11, 20-27 and 47 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such away as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The instant claims 1-11, 24-27 are drawn to an isolated peptide fragment of a natural cytotoxicity receptor of an NK cell, comprising a linker peptide connecting the

extracellular domain of the receptor to the transmembrane portion of the receptor, said peptide exhibiting at least one activity selected from binding to a viral infected cell or binding to a tumor cell, wherein said peptide is NKp46 and a pharmaceutical composition comprising said peptide; claim 4 further limits the claimed peptide as being an isolated peptide fragment comprising the amino acid sequence set forth in SEQ ID NO:3, an active fragment, an analog, an isoform, or a derivative thereof, with the proviso that said peptide is other than the polypeptide of SEQ ID NO:1 or 2. However, the specification only describes an isolated NKp46D2 peptide fragment, which is comprised of the proximal domain of the NKp46 molecule corresponding to amino acids 121-254 of NKp46 of isoform A, (SEQ ID NO:2). Claim 4 recites that the claimed NKp46 fragment comprises the amino acid sequence set forth in SEQ ID NO:3 and is other than SEQ ID NO:1 or 2. However, neither the specification nor the claims describe the structure of the encompassed peptide fragment. The skilled artisan would not be able to visualize all the components of the claimed peptide fragment, other than a fragment comprising the amino acid sequence set forth in SEQ ID NO:3 and that it cannot be SEQ ID NO:1 or 2.

Claims 20-23, encompass a fusion protein comprising a peptide wherein said peptide is an isolated fragment of a natural cytotoxicity receptor of an NK cell, comprising the linker peptide connecting the extracellular domain of the receptor to the transmembrane portion of the receptor, said peptide exhibiting at least one activity selected from binding to a viral infected cell or binding to a tumor cell; other than the fusion proteins of SEQ ID NOS:13-18. However, the specification describes only a

fusion protein comprising the natural cytotoxcity receptor NKp46 and the Fc portion of human IgG1, (NKp46-Ig). No other fusion proteins have been described.

Claim 47 encompasses a variant polypeptide comprising NKp46 receptor polypeptide or an active fragment thereof having at least a single amino acid substitution in an epitope required for the recognition of viral-infected cells or tumor cells. However, the specification only describes one variant of NKp46, wherein amino acid 225 of the isofrom A is substituted with asparagine without destroying the desired activity of binding viral infected cell or tumor cell.

Accordingly, there is insufficient guidance and direction as to the structure of the encompassed genus of the encompassed isolated peptide fragments, fusion proteins, active fragments, analogs, isoforms or derivatives thereof, or variants of NKp46 receptor polypeptide or an active fragment thereof having at least a single amino acid substitution in an epitope required for the recognition of viral-infected cells or tumor cells. To provide evidence of possession of a claimed genus, the specification must provide sufficient distinguishing identifying characteristics of the genus. The factors to be considered include disclosure of compete or partial structure, physical and/or chemical properties, structure/function correlation, methods of making the product, or any combination thereof. In this case, neither the claims nor the specification provides a structure for the encompassed molecules. There is not even identification of linker peptide, extracellular domain or transmembrane domain that is conserved so the encompassed active fragments, analogs, isoforms or derivatives thereof would retain the desired activity of binding viral infected cells or tumor cells. Accordingly, in the

absence of sufficient recitation of distinguishing identifying characteristics, the specification does not provide adequate written description of the genus of peptide fragments, fusion proteins or active fragments, analogs, isoforms or derivatives or variants of NKp46 claimed in the instant invention.

Vas-Cath Inc. v. Mahurkar, 19USPQ2d 1111, clearly states that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention. The invention is, for purposes of the 'written description' inquiry, whatever is now claimed." (See page 1117.) The specification does not "clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed." (See Vas-Cath at page 1116). As discussed above, the skilled artisan cannot envision the detailed chemical structure of the encompassed genus of polypeptides, and therefore conception is not achieved until reduction to practice has occurred, regardless of the complexity or simplicity of the method of isolation. Adequate written description requires more than a mere statement that it is part of the invention and reference to a potential method of isolating it. The compound itself is required. See Fiers v. Revel, 25 USPQ2d 1601 at 1606 (CAFC 1993) and Amgen Inc. v. Chugai Pharmaceutical Co. Ltd., 18 USPQ2d 1016.

One cannot describe what one has not conceived. See Fiddes v. Baird, 30 USPQ2d 1481 at 1483. In Fiddes, claims directed to mammalian FGF's were found to be unpatentable due to lack of written description for that broad class. The specification provided only the bovine sequence.

Therefore, an isolated NKp46D2 peptide fragment, which is comprised of the proximal domain of the NKp46 molecule corresponding to amino acids 121-254 of NKp46 of isoform A, a fusion protein comprising the natural cytotoxcity receptor NKp46 and the Fc portion of human IgG1, (NKp46-Ig) or a variant of NKp46, wherein amino acid 225 of the isofrom A is substituted with asparagine, but not the full breadth of the claims meet the written description provision of 35 U.S.C. §112, first paragraph.

Applicant is reminded that Vas-Cath makes clear that the written description provision of 35 U.S.C. §112 is severable from its enablement provision (see page 1115).

Rejections Under § 112, second paragraph:

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 20-27 and 47-48 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7a. Claims 20, 24 recites the limitation "the linker peptide" in 3, 4, respectively. However, there is insufficient antecedent basis for this limitation in the claims.

7b. Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: Claim 20, is drawn to a fusion protein, however, there is no recitation of all the components of the claimed fusion protein. The claim recites that the claimed fusion protein comprises a fragment of

a cytotoxicity receptor of NK cells that comprises a linker peptide that connects the extracellular domain to the transmembrane domain. Thus the linker peptide, the extracellular domain and the transmembrane domain are all part of recited receptor. However, there is no recitation of the identity of the other portion of the claimed fusion protein.

7c. Claim 20 recites in line 5 "..., said peptide exhibiting at least one activity...;, however, it is unclear whether the peptide exhibits the recited activities alone or as a part of a fusion protein.

7d. Claim 1 recites in lines 4-5 "..., said peptide exhibiting at least one activity...",however, it is unclear what peptide this phrase is referring to because the claim recites both a "peptide fragment" (line 1) and a "linker peptide" (line 2).

7e. Claim 20 recited "..; other than the fusion proteins of SEQ ID NOs:13-18" in line 7. However, the way the claim is drafted, it is unclear whether the claimed fusion protein is "other than the fusion proteins of SEQ ID NOs:13-18". It is suggested to recite "wherein said fusion protein is other than the fusion proteins of SEQ ID NOs:13-18".

Claims 21-23, 25-27 and 48 are also rejected under 35 U.S.C. 112, second paragraph, is so far as they depend from claims 20, 24 and 47 for limitations.

Claim rejections-35 USC § 102:

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8a. Claims 1-3, 24-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Mandelboim et al, (WO 02/08287, published on 31 January 2002).

Claims 1-3 are drawn to an isolated peptide fragment of a natural cytotoxicity receptor of an NK cell, comprising a linker peptide connecting the extracellular domain of the receptor to the transmembrane portion of the receptor, said peptide exhibiting at least one activity selected from binding to a viral infected cell or binding to a tumor cell, said peptide which is glycosylated, a variant of NKp46; a pharmaceutical composition comprising said peptide

Mandelboim et al disclose a full length human NKp46 that comprises a linker peptide, an extracellular domain and a transmembrane domain, and demonstrates that it binds hemagglutinin (HA) of influenza virus in viral-infected cells, (see example 6 on page 49, paragraph 3). Mandelboim et al disclose a fragment of human NKp46 that comprises amino acids 121-234 of the human NKp46 receptor and shows that said variant also binds to hemagglutinin (HA) of influenza virus in viral-infected cells (see Example 11 on pages 57-58). Mandelboim et al also disclose a pharmaceutical composition comprising said receptor, (see page 8, 2nd paragraph and page 33, last paragraph).

Thus, Mandelboim et al reference anticipates instant claims 1-3, 24-27, in the absence of any evidence on the contrary.

8b. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Cantoni et al, (the Journal of experimental medicine, 1999, Vol. 189, No. 5, pp. 787).

Claims 1-3 are drawn to an isolated peptide fragment of a natural cytotoxicity receptor of an NK cell, comprising a linker peptide connecting the extracellular domain of the receptor to the transmembrane portion of the receptor, said peptide exhibiting at least one activity selected from binding to a viral infected cell or binding to a tumor cell, said peptide which is glycosylated.

Cantoni et al NKp44, a type I glycoprotein, comprising an extracellular domain, a transmembrane and a membrane proximal region,(see page 791, column 1). Cantoni et al teach that the NKp44 recognizes tumor cells and lyses them, (see page 790, column 2 and figure 2).

Thus, the Cantoni et al reference anticipates instant claims 1-3 in the absence of any evidence on the contrary.

Conclusion:

9. No claim is allowed.

Advisory Information:

Any inquiry concerning this communication or earlier communications from the examiner should be directed to FOZIA M. HAMUD whose telephone number is (571)272-0884. The examiner can normally be reached on Monday-Friday: 8:00 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Manjunath N. Rao can be reached on (571) 272-0939. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Fozia Hamud
Patent Examiner
Art Unit 1647
07 March 2009

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Primary Examiner, Art Unit 1647